BE Kingsbury

September 21, 1966

Dr. T. W. Liao
Laboratory Operation
Building 10-7
PHILADELPHIA

Subject: Voltage Dividers
CIGRE S.C. No. 8

Dear Charlie,

In answer to your request for voltage divider response data, we have compiled for two different types of circuit. The one with the low Rd is a stranger to me. Bill Bodenstein said it is used by the Bureau of Standards. (Parks & Cone)

We did not choose to cut the film, and will rely upon your returning it to us after your examination.

Call me and we will set up a date for your visit to Baltimore to measure divider response.

Sincerely yours,

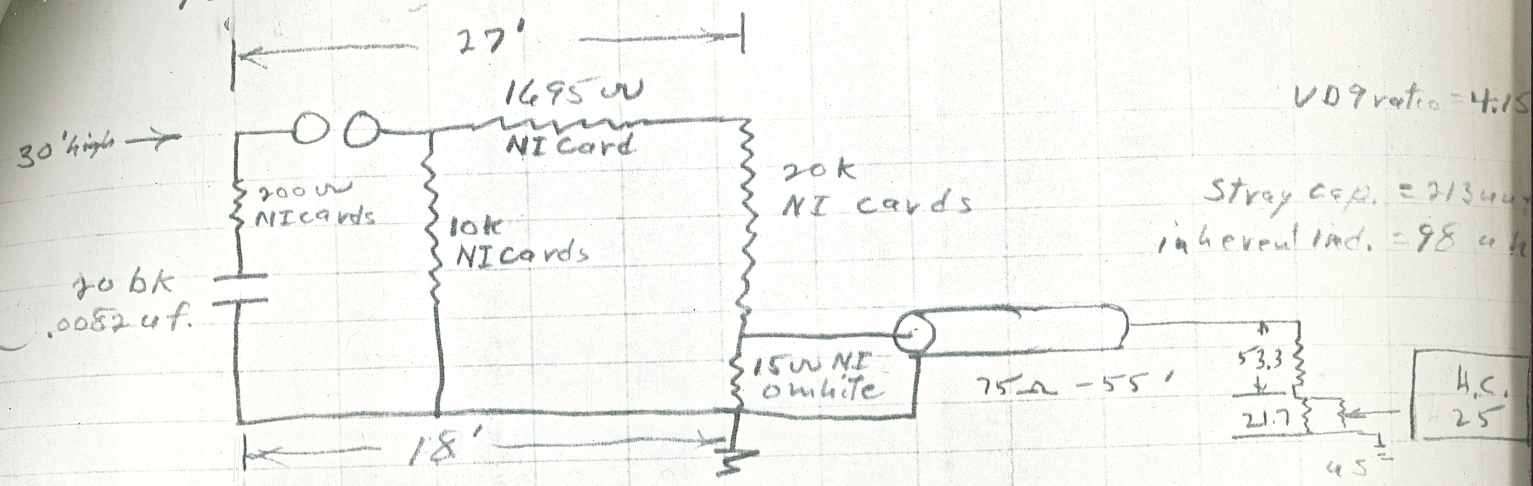
Cliff Matthews, Manager
High Voltage Laboratory

clk

9/15/66

(1)

7/1m # V-18 (Volt Time Curve test on an 18 unit string of #1840 Sasp. insulators



VD9 ratio = 4.15

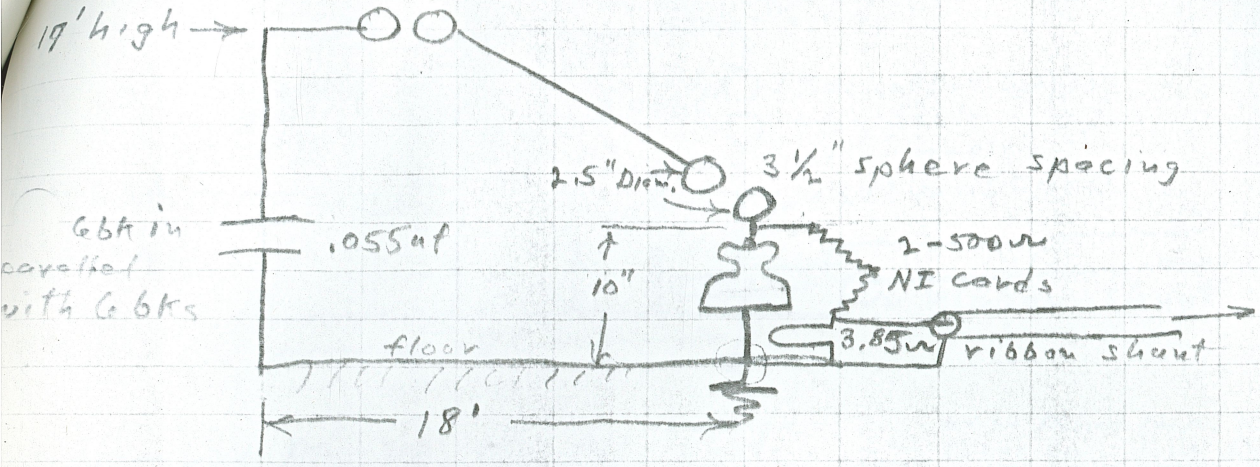
Stray cap. = 213 uuf
Inherent ind. = 98 u he

Frame	LSV	DC	VD	KC	Pol	Impulse shots	SW	AV on DC line	DC line Div.	Imp. Div.	AV crest	Chop time
1, 2, 3	235	300	9	200	Pos.	0 0 0	70 us.	1996	33	26 25.5	1648 1518	—
4, 5, 6	240	″	″	″	″	F 0 0	″	″	33	26	1518	12
7, 8, 9	245	″	″	″	″	F F F	″	″	33	26.5	1600	10 9.5 10
10, 11, 12	250	″	″	″	″	F F F	″	″	33 33	27.5 27	1621 1621	8.0 8.0
13, 14, 15	255	″	″	″	″	F F F	″	″	33	27.5 27	1663 1663	8.0 8.0
16, 17, 18	260	″	″	″	″	F F F	″	″	32.5 33	28 28.5	1693 1744	7.0 8.0 7.5
19, 20, 21	265	″	″	″	″	F F F	″	″	33	28.5	1744	6.0 6.5
22, 23, 24	270	″	″	″	″	F F F	″	″	33	28.5	1724	5.9
25, 26, 27	275	″	″	″	″	F F F	35 us	″	33	29	1753	4.1 3.9
28, 29, 30	280	″	″	″	″	F F F	″	″	33	29 29.3	1753 1770	3.9 4.1 3.9
31, 32, 33	285	″	″	″	″	F F F	″	″	33	29 29.5	1753 1785	4.1 4.3 3.9
34, 35, 36	285	″	″	″	″	F F F	″	″	33	29.5 29.5	1785 1785	3.7 3.4 3.7
37, 38, 39	290	″	″	″	″	F F F	″	″	33	29.5 30	1785 1840	3.4 3.9 3.7
40, 41, 42	295	″	″	″	″	F F F	″	″	30.5	30	1840 1842	3.9 3.7 3.9
43, 44, 45	300	″	″	1000	″	X F F	15 us	″	33	30.5	1842	3.0
46, 47, 48	305	″	″	″	″	F F F	″	″	33	31	1871	2.9
49, 50, 51	310	″	″	″	″	F F F	″	″	33	31 31.5	1903 1903	2.3 2.5
52, 53, 54	320	″	″	″	″	F F F	″	″	32.5	31.5	1903	2.2
55, 56, 57	330	″	″	″	″	F F F	″	″	33	32	1944	2.2 2.0
58, 57, 60	340	″	″	″	″	F F F	″	″	33	32 33	1944 1994	1.6 2.0 1.8
61, 62, 63	350	″	″	″	″	F F F	″	″	33	33	1994	1.8
7/1m V-19												
1 2 3	360	″	″	″	″	F F F	″	″	32.5	33.5	2052	1.7
4 5 6	370	″	″	″	″	F F F	″	″	32.5	34	2086	1.7
7 8 9	380	″	″	″	″	F F F	5 us	″	32.5	34 34.3	2086 2115	1.9 1.7

9/16/66

(2)

Film # S7-7 (1-#77 Pin Type Insulator)



Frame	LSU	DC	VD	KC	Pol	Impulse Shots	SW	KV on DC Line	DC Line Div	Imp Div	KV Crest	Front Time	KV/45
308/309	250	200	7	5000	Pos	SF pct.	1	265	58	90	410	.06	6850
310/311	″	″	″	″	″	SF ″ pct.	″	″	57.5	100.5	465	.084	5530
312	″	″	″	″	″	SF SF pct.	″	″	56	102 106	482	.082 .064	5820 7850
315/314	″	″	″	″	″	SF ″ pct.	″	″	54	124	5850	.058	6670
312	″	″	″	″	″	SF	″	″	55.5	129	572	.073	7850

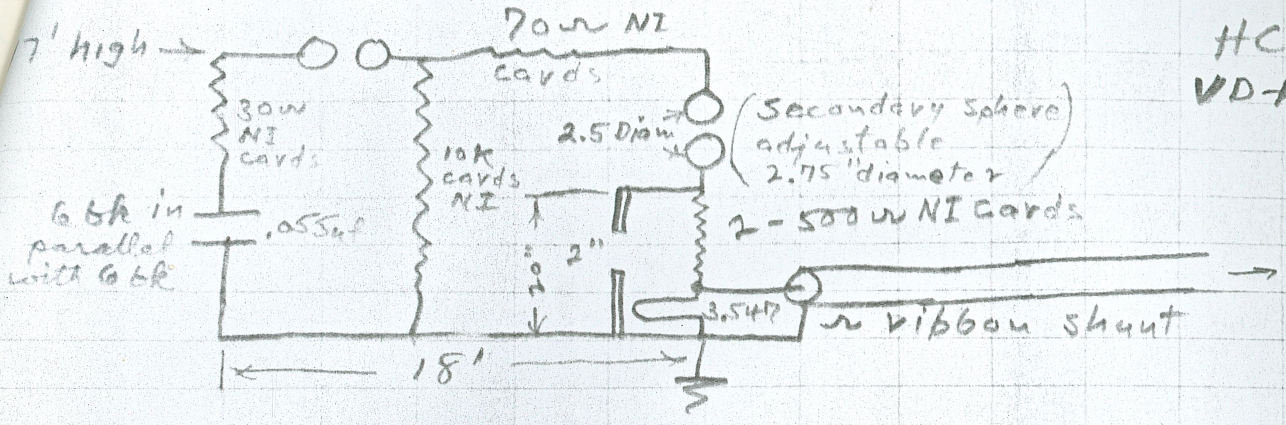
This generator of 6bks in parallel with 6bks has a stray capacitance of 20 mmf. and an inherent inductance of 46.2 mh

9/15/66

(3)

2 1/2" V-15 (1/2" sqr. rod gap 2" spacing)

Three shots were taken at various secondary sphere spacings.



HC-25 Scope
VD-11 ratio = 3.45

Frame	LSV	DC	VD	HC	Pol	Impulse Shots	SW	KV on Dcline	Dcline Div.	Imp. Div	KV Crest	Front time	KV/μs	Sphere Space
162	95	300V	11	5000	Pos	CW ✓ CW ✓	1μs	316	16.5	7.5	144	.14μs	1440	Shorted
344	✓	✓	✓	✓	✓	CW ✓ CW ✓	1μs	✓	16.5	7.5	144	.12	1200	1/4"
586	✓	✓	✓	✓	✓	CW ✓ CW ✓	1μs	✓	16.5	7.5	144	.107	1340	1/2"
708	✓	✓	✓	✓	✓	CW ✓ CW ✓	1μs	✓	16.5	7.5	144	.05	3900	1"
9610	✓	✓	✓	✓	✓	CW ✓ CW ✓	1μs	✓	16.5	7.0	134	.0313	4,300	2"
11912	✓	✓	✓	✓	✓	CW ✓ CW ✓	2μs	✓	16.5	6.5	124	.027	4,600	3"

This generator of 6 Bks in parallel with 6 Bks. has a stray capacitance of 209 μμf. and an inherent inductance of 46.2 uh

143.6 × 1.414 × 2 = 407 ratio of LSV to 6K voltage

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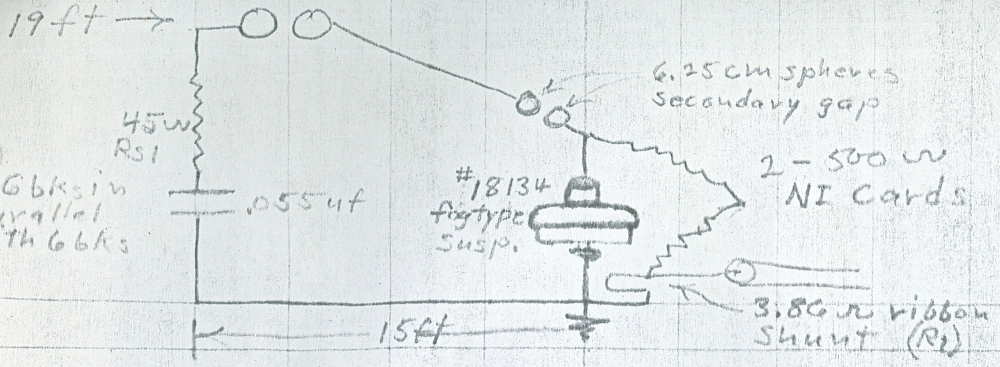
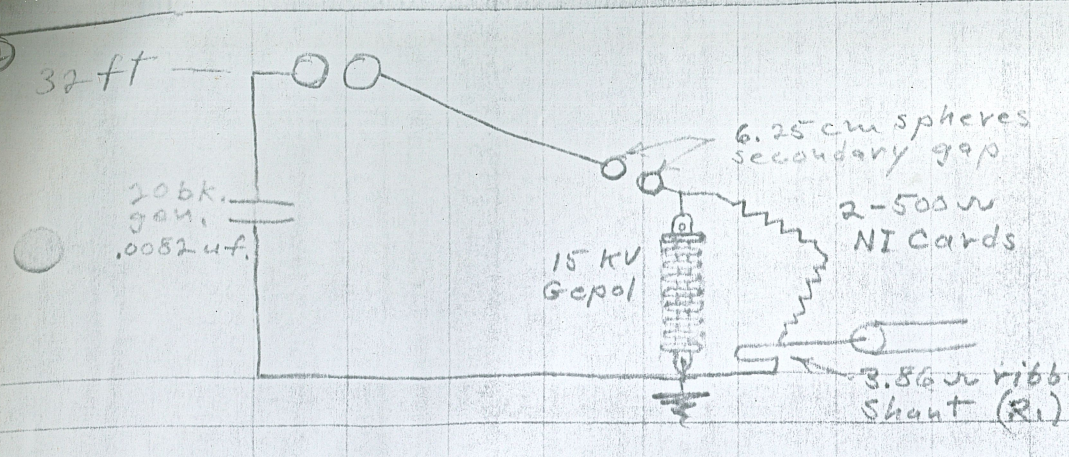
2/28/58
Neg 3.



capacitance of sample insulator = 32 μμf

Film #	Frame	LSV	DC	KC	VD	R1	Pol	Imp Shots	SW	KV on DC line	Crest KV	μs to crest	KV/μs	Secondary gap Set.
6	777	200	200	5K	8	3.86	Pos	11111	1 μs	247				2"
	782	150	↓	↓	↓	↓	↓	11111	↓	↓				1"
	787	200	↓	↓	↓	↓	↓	11111	↓	↓				1"

5/1/67
2 of 3



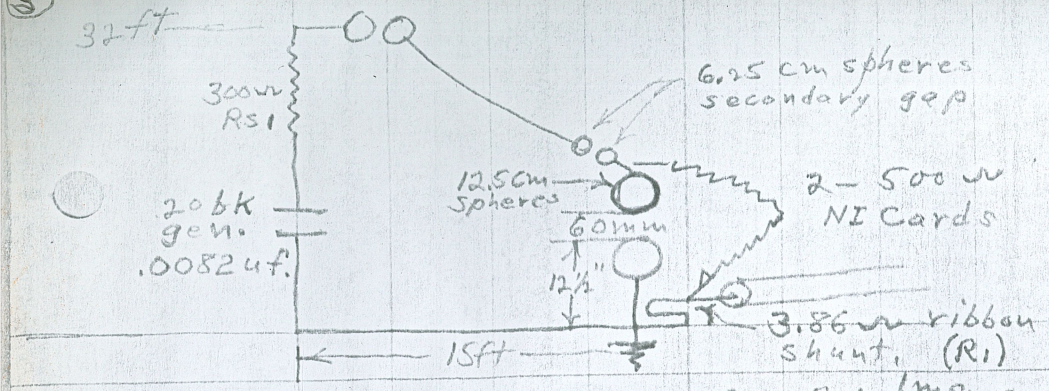
capacitance of sample insulator = .2 uuf

Film	Frame	LSV	DC	KC	VD	R_1	Pol	Imp Shots	SW	KV on Dcline	Crest KV	us to crest	KV/us	Secondary gap Set.
1	671	200	200	5K	7	3.56	Pos	1	1 us.	262	496/493	081/084	568/550	2"
	675	″	″	″	″	″	″	1	″	″	570/—	075/079	6500/6470	2 1/4"
	678	″	″	″	″	″	″	1	″	″	524/485	084/087	5780/5540	2 1/2"
	681	″	″	″	″	″	″	1	″	″	538/516	087/093	6180/5540	3"
	656	″	″	″	″	″	″	1 ng	″	″	530/—	081/—	6540/—	3 1/2"

(ng = no good)

(3)

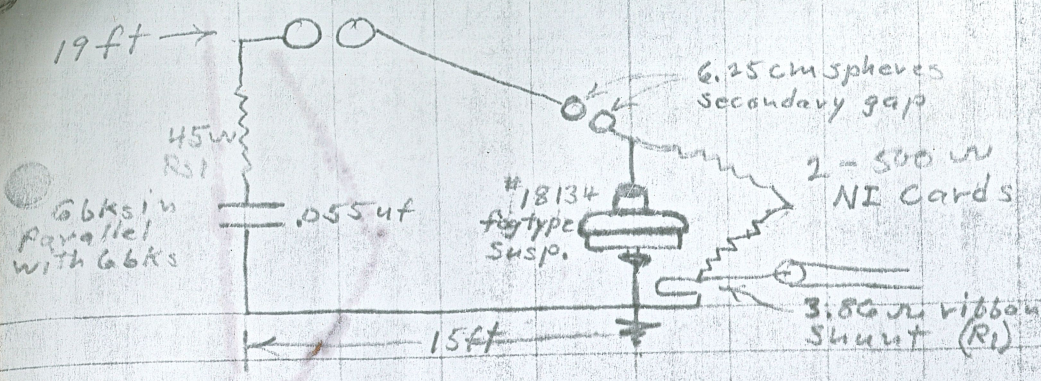
4/28/67
74-93.



Film	Frame	LSV	DC	KC	VD	R1	Pol	Imp. shots	SW	KV on DC line	KV crest	μs to crest	KV/μs	Secondary gap set.
(Not full charge) 1 –	570	175	200	5K	11	3.86	Pos	1	1μs.	187	235 / 240	.137	1720 / 1760	Shorted
	576	″	″	″	″	″	″	1 ng	″	″	249 / 245	1.08 / 1.13	2280 / 2160	″
	583	″	″	″	″	″	″	1	″	″	242 / 252	120 / 115	2030 / 2200	1″
	598	″	″	″	″	″	″	1	″	″	257 / 260	109 / 107	2340 / 2430	1¼″
	602	″	″	″	″	″	″	1	″	″	238	142	1680	¾″
	608	″	″	″	″	″	″	1	″	″	248	084	2850	2″
– 2 –	613	″	″	″	″	″	″	1	″	″	245 / 250	080 / 094	2760 / 2720	1½″
		Added 740Ω Rs2 at top of gen. (4-60; 4-125Ω cards)												
	620	175	200	5K	11	3.86	Pos	1	1μs.	187	241	159 / 152	1510 / 1580	1½″
	633	″	″	″	″	″	″	1 ng	″	″	235	197 / 183	1210 / 1300	1¼″
	638	″	″	″	″	″	″	1	″	″	238 / 234	213 / 225	1120 / 1040	1″
		Took out 300Ω Rs1 in generator												
3 –	641	175	200	5K	11	3.86	Pos	1 ng ng	1μs	187	236	.188	1250	1″
	646	″	″	″	″	″	″	1	″	″	240 / 234	170 / 151	1410 / 1550	1¼″
	649	″	″	″	″	″	″	1	″	″	229 / 236 / 249	170 / 154	1350 / 1560	1½″
		Took out 740Ω Rs2 at top of generator												
	656	175	200	5K	11	3.86	Pos	1	1μs	187	259 / 255	092 / 091	2810 / 2790	1½″
	661	″	″	″	″	″	″	1	″	″	247 / 248	105 / 104	2300 / 2330	1¼″
	666	″	″	″	″	″	″	1	″	″	255 / 253	131 / 129	1950 / 1960	1″

(ng – no good)

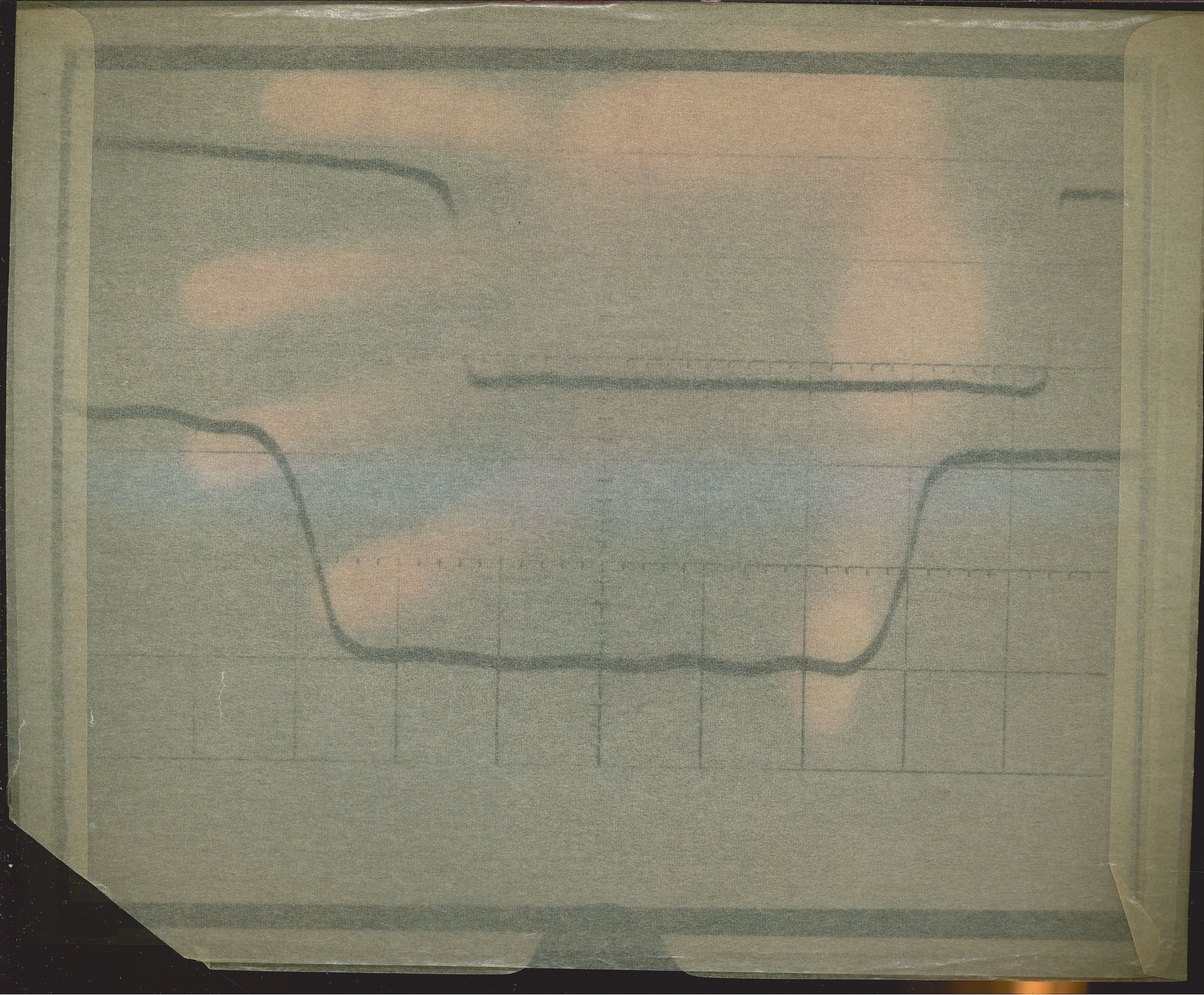
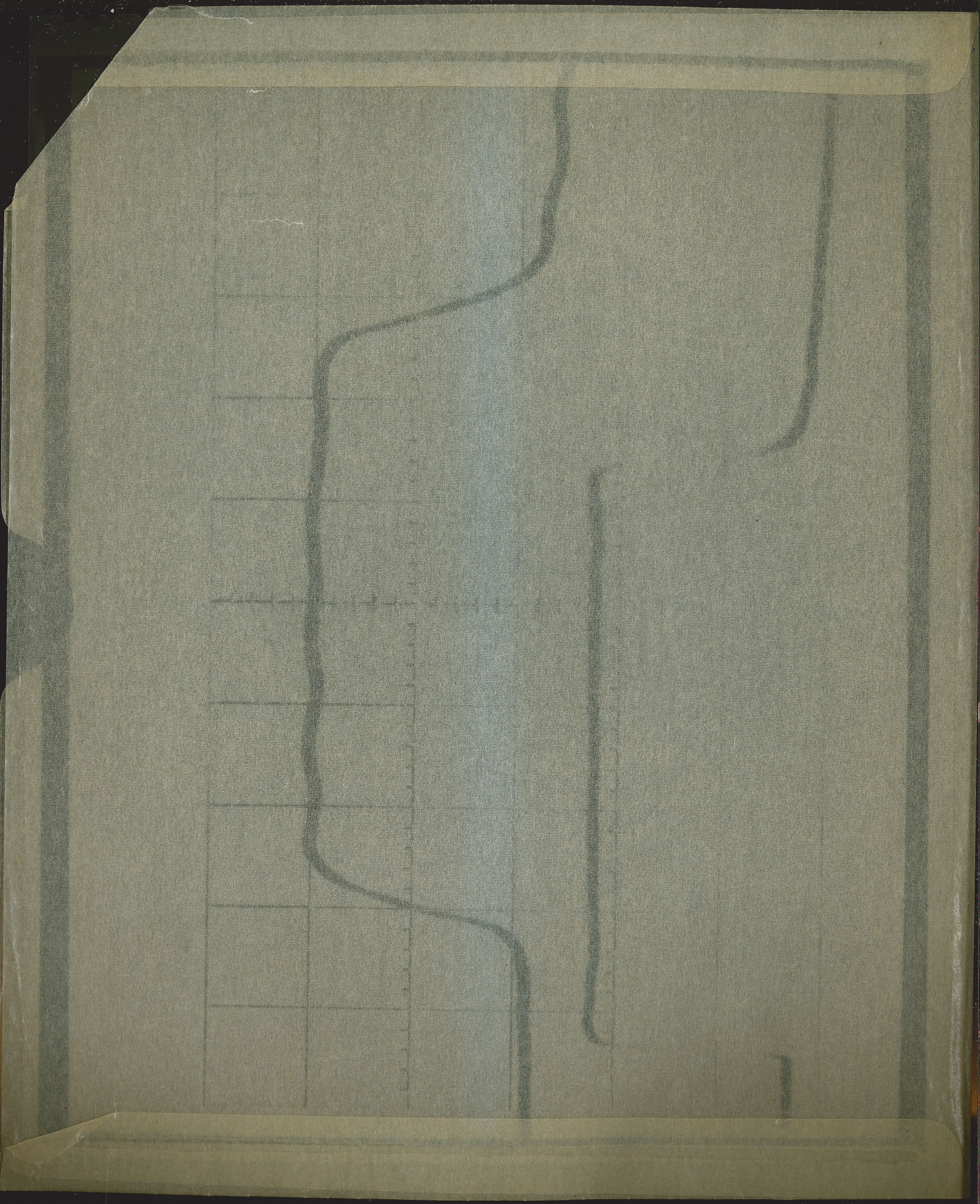
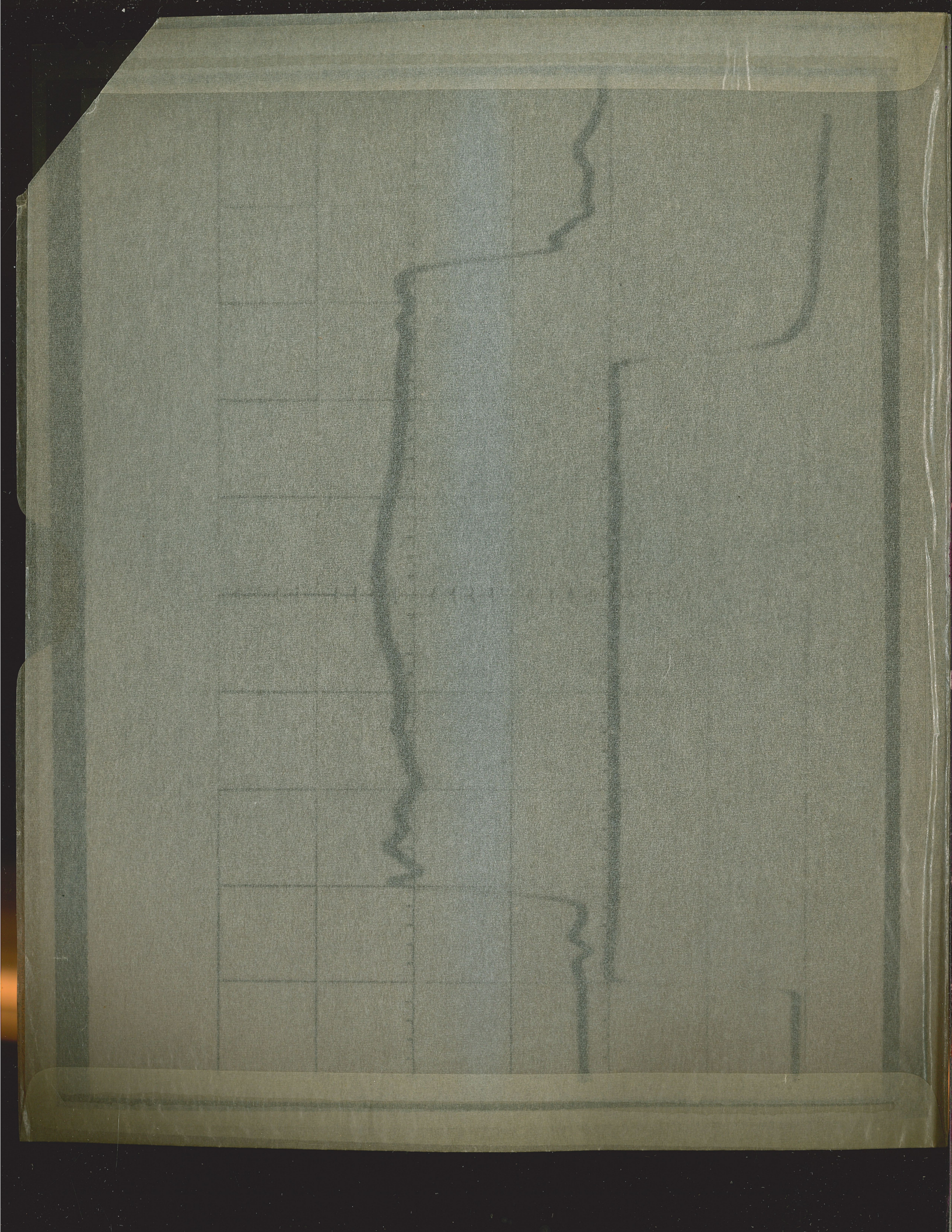
2/28/58
W-43.



capacitance of sample Insulator = 32 uuf

Film	Frame	LSV	DC	KC	VD	R1	Pol	Imp Shots	SW	KV on DC line	Crest KV	us to Crest	KV/us	Secondary Gap Set.
#6	777	200	200	5K	8	3.86	Pos	11111	145	247				2"
	782	150	↓	↓	↓	↓	↓	11111	↓	↓				1"
	787	200	↓	↓	↓	↓	↓	11111	↓	↓				1"

IMPORTANT

Originals and/or Negatives

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